

**Mendocino County Employees'  
Retirement Association**



# **Compliance with Risk ASOP 51**

***November 6, 2019***

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# Actuarial Standard Of Practice No. 51

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- New Risk ASOP 51 applicable to pension plan funding valuations
- Risk: actual future measurements deviating from assumptions
- Effective with June 30, 2019 valuation for MCERA
  - New Subsection J added to Section 2 of funding report
- Discussion today on whether the Board would want Segal to prepare a stand-alone Risk Report



# Steps Actuary Needs to Take to Comply with ASOP 51

- **Identify and assess risks** that may affect the plan's future financial conditions
  - **Standard does not require numerical assessment**
- Recommend a **more detailed assessment** if actuary believes it would be significantly beneficial to intended users
- Calculate and disclose **plan maturity measures**
- Identify and disclose **historical values of actuarial measurements** that are significant in understanding plan risks
- Prepare actuarial communication



# Risk Assessments – Current and New

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- Some qualitative and quantitative measures, historical trends and plan maturity information already in Segal's funding reports
  - Qualitative and quantitative measures
    - Asset/liability mismatch risk
    - Investment risk
    - Longevity risk
    - Reconciliation of changes in UAAL, employer and employee rates
  - Historical trends
    - Funded ratios
    - Returns on asset
    - UAAL amounts
  - Plan maturity information
    - Ratio of payees to actives
    - Asset and liability volatility ratios

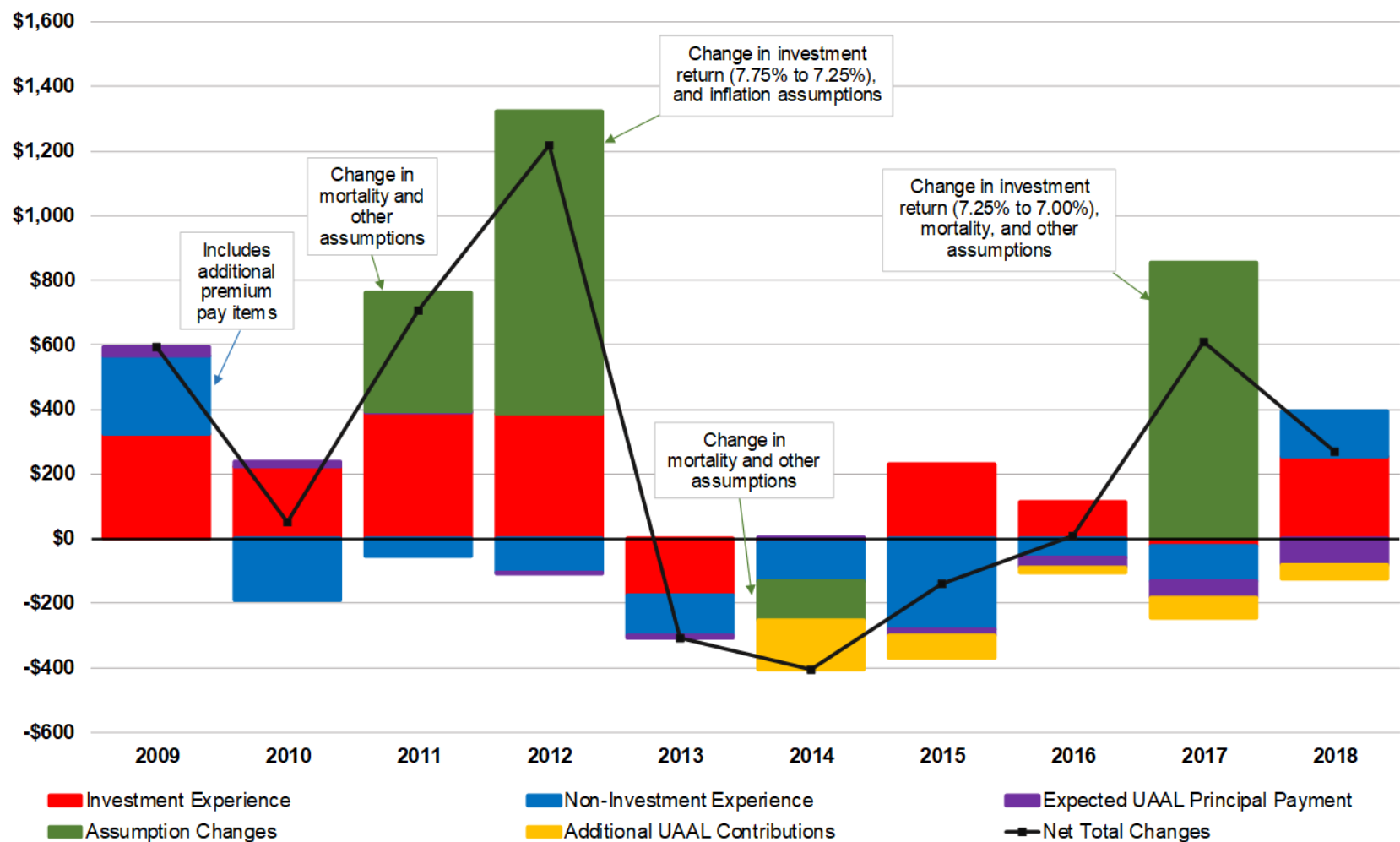
# Risk Assessments – Current and New

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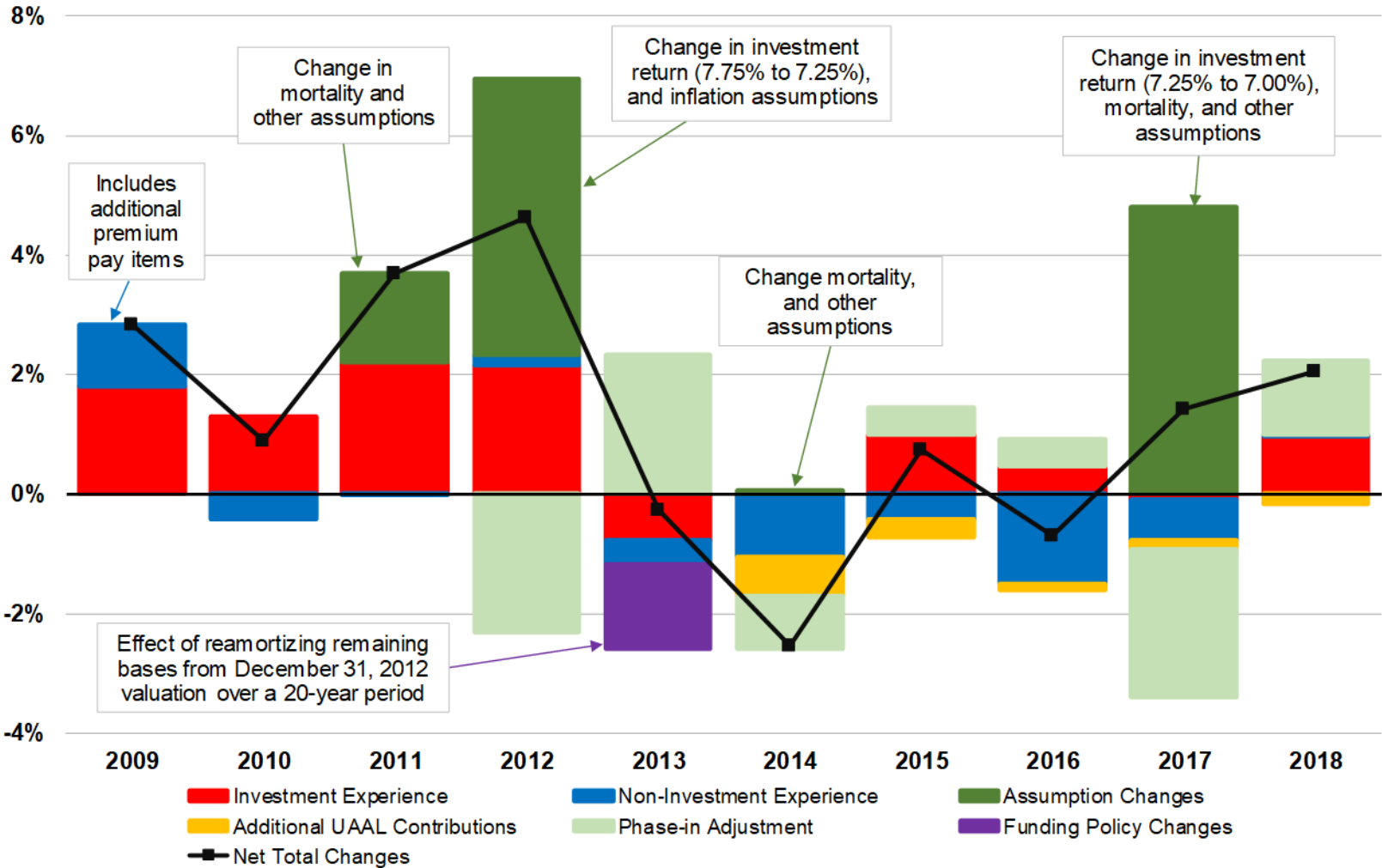
## ➤ Stand-alone risk report

- New Risk Assessment Report to include
  - Two new historical information displays
  - Can include various quantitative risk assessments
    - » Scenario tests, sensitivity tests, stochastic modeling, etc.
  - Actual content based on discussion with MCERA
- Our cost to prepare stand-alone report will vary based on scope and what information is readily available
  - How often to prepare report

# Historical Factors that Changed UAAL (Sample 1937 Act Retirement System)



# Historical Factors that Changed Employer's Contribution Rates (Sample 1937 Act Retirement System)



# Quantitative Risk Assessments Methods

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- Scenario Tests – impact of future experience (“events”)
- Stress Tests – impact of “adverse changes in factors affecting a plan’s financial condition” (i.e., experience)
- Sensitivity Tests – impact of assumption changes
- Stochastic Modeling – distribution of future experience



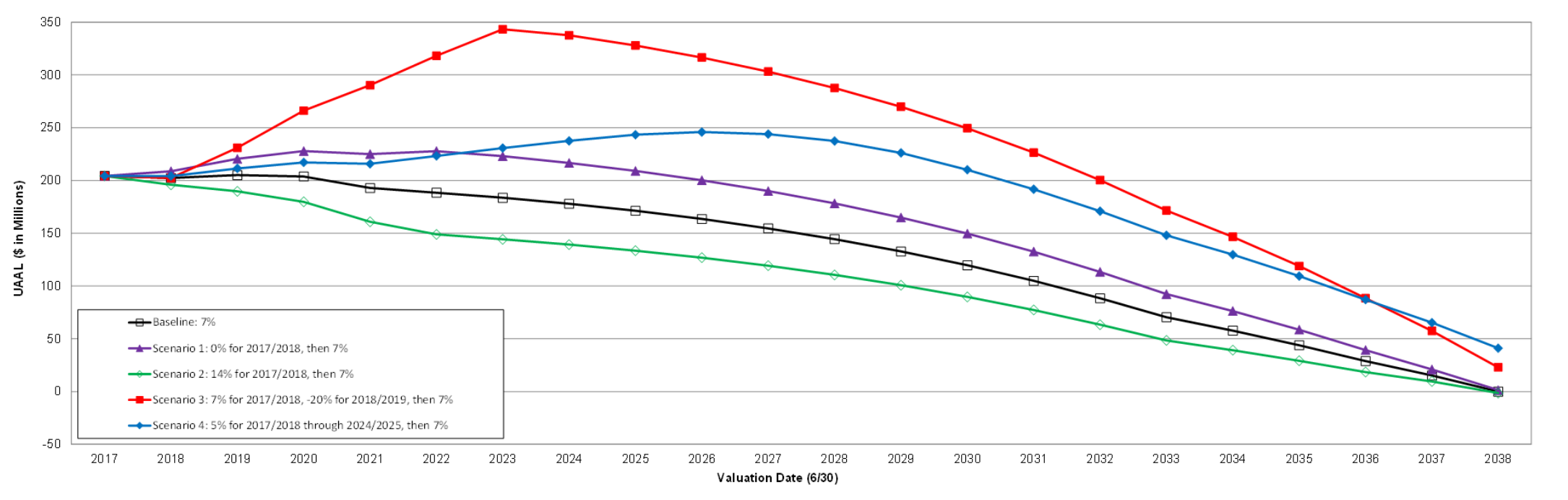
# Practical Investment Return Scenario Test

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- Baseline: assets earn expected return every year
- Scenario tests: one year of asset gain or loss
  - Actual return either zero or 2 x assumed
- Realistic range of short term experience
  - Avoids looking like a forecast
  - Useful for employer budgeting as actual experience emerges
- Similar analyses prepared for MCERA in 2018
  - Using results from June 30, 2017 valuation

# Scenarios Tests - UAAL and Funded Ratios Under Five Hypothetical Market Returns (MCERA letter Dated April 11, 2018)

Exhibit 2A: Projected Unfunded Actuarial Accrued Liability (UAAL)  
Under Different Market Return Scenarios  
(\$ in Millions)

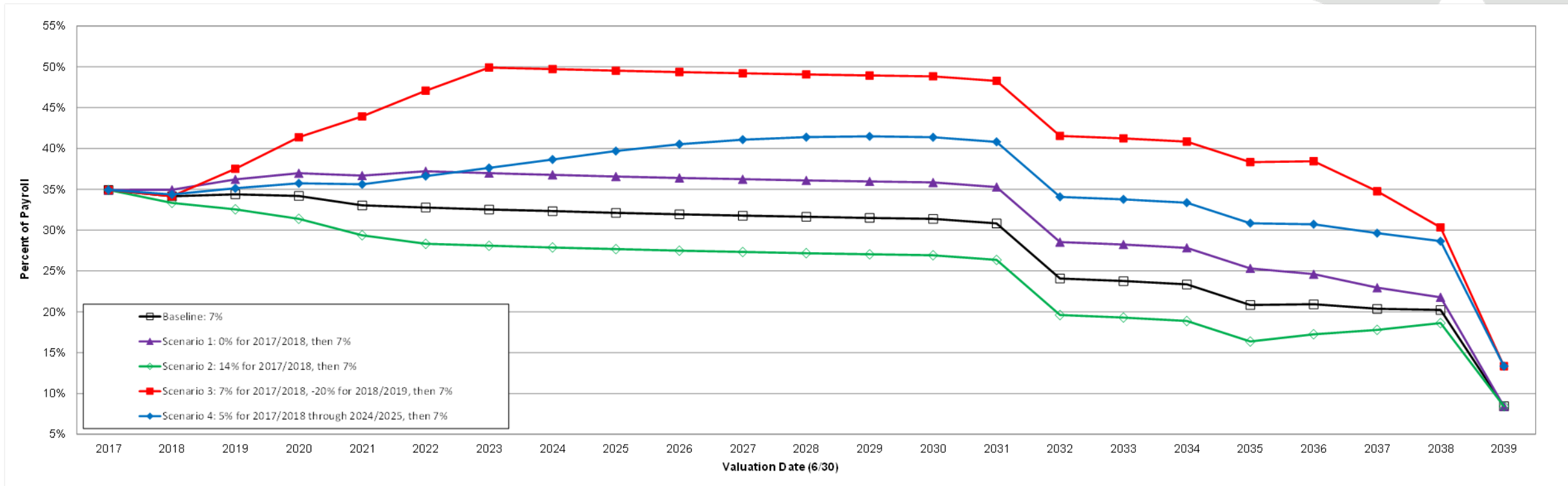


Valuation Date (6/30)	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Baseline: 7%	\$204	\$202	\$205	\$204	\$193	\$188	\$184	\$178	\$171	\$164	\$155	\$144	\$133	\$120	\$105	\$88	\$70	\$58	\$44	\$29	\$15	\$0
Scenario 1: 0% for 2017/2018, then 7%	204	209	221	228	225	228	223	217	209	200	190	178	165	150	133	113	92	76	59	39	21	1
Scenario 2: 14% for 2017/2018, then 7%	204	196	190	180	161	149	144	139	134	127	119	111	101	90	77	63	49	39	29	18	10	-1
Scenario 3: 7% for 2017/2018, -20% for 2018/2019, then 7%	204	202	231	266	290	318	343	338	328	317	303	288	270	250	226	200	172	147	119	88	58	23
Scenario 4: 5% for 2017/2018 through 2024/2025, then 7%	204	204	211	217	216	223	231	238	243	246	244	237	226	210	192	171	148	130	109	87	65	41

Funded Percentage																						
Valuation Date (6/30)	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Baseline: 7%	69.9%	71.2%	71.8%	72.9%	75.1%	76.4%	77.6%	78.9%	80.2%	81.6%	83.1%	84.6%	86.1%	87.8%	89.6%	91.4%	93.3%	94.7%	96.0%	97.5%	98.7%	100.0%
Scenario 1: 0% for 2017/2018, then 7%	69.9%	70.3%	69.7%	69.7%	70.9%	71.4%	72.8%	74.3%	75.9%	77.5%	79.2%	80.9%	82.8%	84.7%	86.8%	89.0%	91.2%	92.9%	94.7%	96.5%	98.2%	99.9%
Scenario 2: 14% for 2017/2018, then 7%	69.9%	72.1%	73.9%	76.1%	79.2%	81.3%	82.4%	83.5%	84.6%	85.7%	86.9%	88.2%	89.5%	90.9%	92.3%	93.8%	95.4%	96.4%	97.4%	98.4%	99.2%	100.1%
Scenario 3: 7% for 2017/2018, -20% for 2018/2019, then 7%	69.9%	71.2%	68.2%	64.6%	62.5%	60.1%	58.2%	60.0%	62.2%	64.4%	66.8%	69.2%	71.8%	74.6%	77.5%	80.5%	83.7%	86.4%	89.3%	92.2%	95.1%	98.1%
Scenario 4: 5% for 2017/2018 through 2024/2025, then 7%	69.9%	71.0%	70.9%	71.1%	72.1%	72.0%	71.9%	71.9%	71.9%	72.4%	73.3%	74.6%	76.4%	78.6%	80.9%	83.4%	86.0%	88.0%	90.1%	92.3%	94.4%	96.6%

# Scenarios Tests - Employer Contribution Rates Under Five Hypothetical Market Returns (MCERA letter Dated April 11, 2018)

Exhibit 1A: Projected Employer Rates Under Different Market Return Scenarios

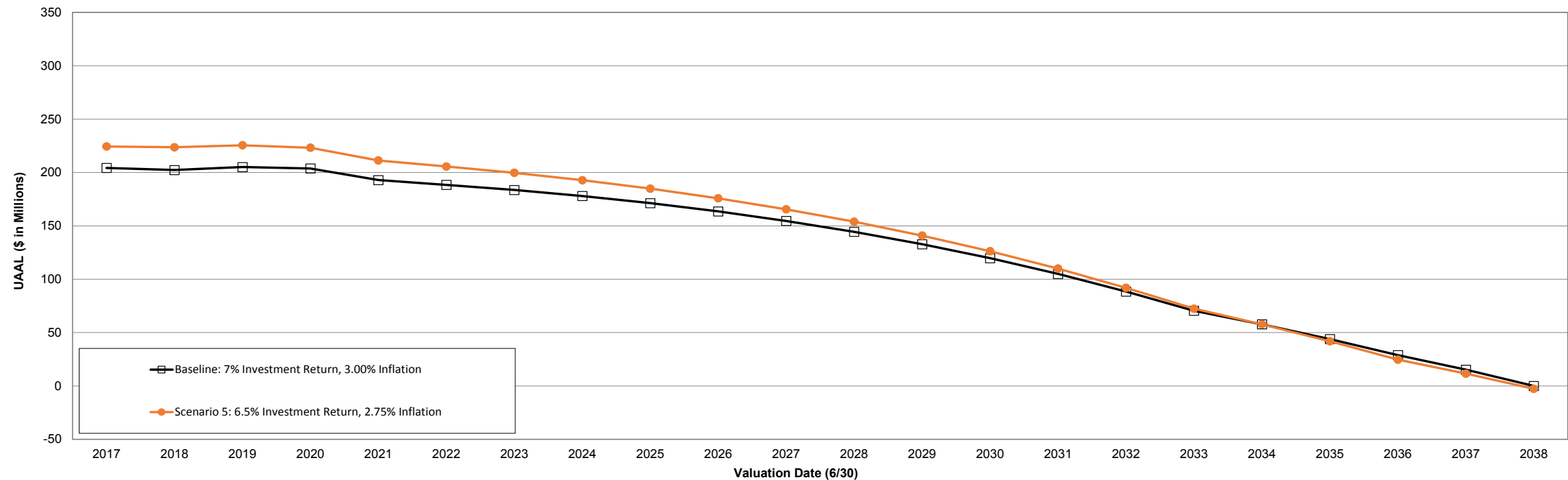


Valuation Date (6/30)	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
<b>Baseline: 7%</b>	34.9%	34.1%	34.4%	34.2%	33.0%	32.8%	32.5%	32.3%	32.1%	31.9%	31.8%	31.6%	31.5%	31.4%	30.8%	24.1%	23.8%	23.4%	20.8%	20.9%	20.4%	20.2%	8.4%
<b>Scenario 1: 0% for 2017/2018, then 7%</b>	34.9%	34.9%	36.2%	37.0%	36.7%	37.2%	37.0%	36.8%	36.6%	36.4%	36.2%	36.1%	36.0%	35.8%	35.3%	28.5%	28.2%	27.8%	25.3%	24.6%	23.0%	21.8%	8.4%
<b>Scenario 2: 14% for 2017/2018, then 7%</b>	34.9%	33.3%	32.6%	31.4%	29.4%	28.3%	28.1%	27.9%	27.7%	27.5%	27.3%	27.2%	27.0%	26.9%	26.4%	19.6%	19.3%	18.9%	16.4%	17.3%	17.8%	18.6%	8.4%
<b>Scenario 3: 7% for 2017/2018, -20% for 2018/2019, then 7%</b>	34.9%	34.1%	37.5%	41.4%	43.9%	47.1%	49.9%	49.7%	49.5%	49.4%	49.2%	49.1%	48.9%	48.8%	48.3%	41.5%	41.2%	40.8%	38.3%	38.4%	34.8%	30.3%	13.3%*
<b>Scenario 4: 5% for 2017/2018 through 2024/2025, then 7%</b>	34.9%	34.4%	35.1%	35.7%	35.6%	36.6%	37.6%	38.7%	39.7%	40.5%	41.1%	41.4%	41.5%	41.4%	40.8%	34.1%	33.8%	33.4%	30.9%	30.7%	29.6%	28.7%	13.4%*

\* The employer contribution rates for Scenarios 3 and 4 will converge to the normal cost rate once all of the UAAL has been amortized. For Scenario 3, this date is June 30, 2041, and for Scenario 4, June 30, 2047.

# Sensitivity Tests - UAAL and Funded Ratios Under Two Sets of Economic Assumptions (MCERA letter Dated April 11, 2018)

Exhibit 2B: Sensitivity of Projected Unfunded Actuarial Accrued Liability (UAAL)  
Under Two Alternative Sets of Economic Assumptions  
(\$ in Millions)

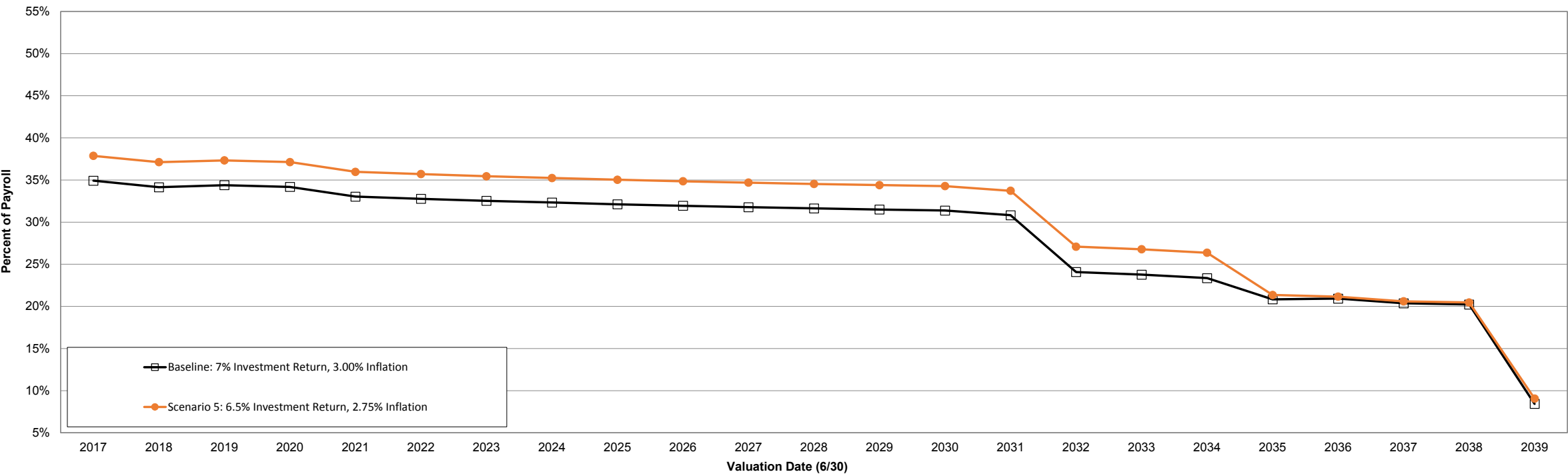


Valuation Date (6/30)	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Baseline: 7% Investment Return, 3.00% Inflation	\$204	\$202	\$205	\$204	\$193	\$188	\$184	\$178	\$171	\$164	\$155	\$144	\$133	\$120	\$105	\$88	\$70	\$58	\$44	\$29	\$15	\$0
Scenario 5: 6.5% Investment Return, 2.75% Inflation	224	224	226	223	211	206	200	193	185	176	166	154	141	126	110	92	72	58	42	25	12	-3

Funded Percentage																						
Valuation Date (6/30)	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Baseline: 7% Investment Return, 3.00% Inflation	69.9%	71.2%	71.8%	72.9%	75.1%	76.4%	77.6%	78.9%	80.2%	81.6%	83.1%	84.6%	86.1%	87.8%	89.6%	91.4%	93.3%	94.7%	96.0%	97.5%	98.7%	100.0%
Scenario 5: 6.5% Investment Return, 2.75% Inflation	67.9%	69.0%	69.7%	70.9%	73.2%	74.6%	76.0%	77.4%	78.9%	80.4%	81.9%	83.6%	85.3%	87.1%	89.0%	91.0%	93.1%	94.6%	96.2%	97.8%	99.0%	100.2%

# Sensitivity Tests - Employer Contribution Rates Under Two Sets of Economic Assumptions (MCERA letter Dated April 11, 2018)

Exhibit 1B: Sensitivity of Projected Employer Rates Under Two Alternative Sets of Economic Assumptions



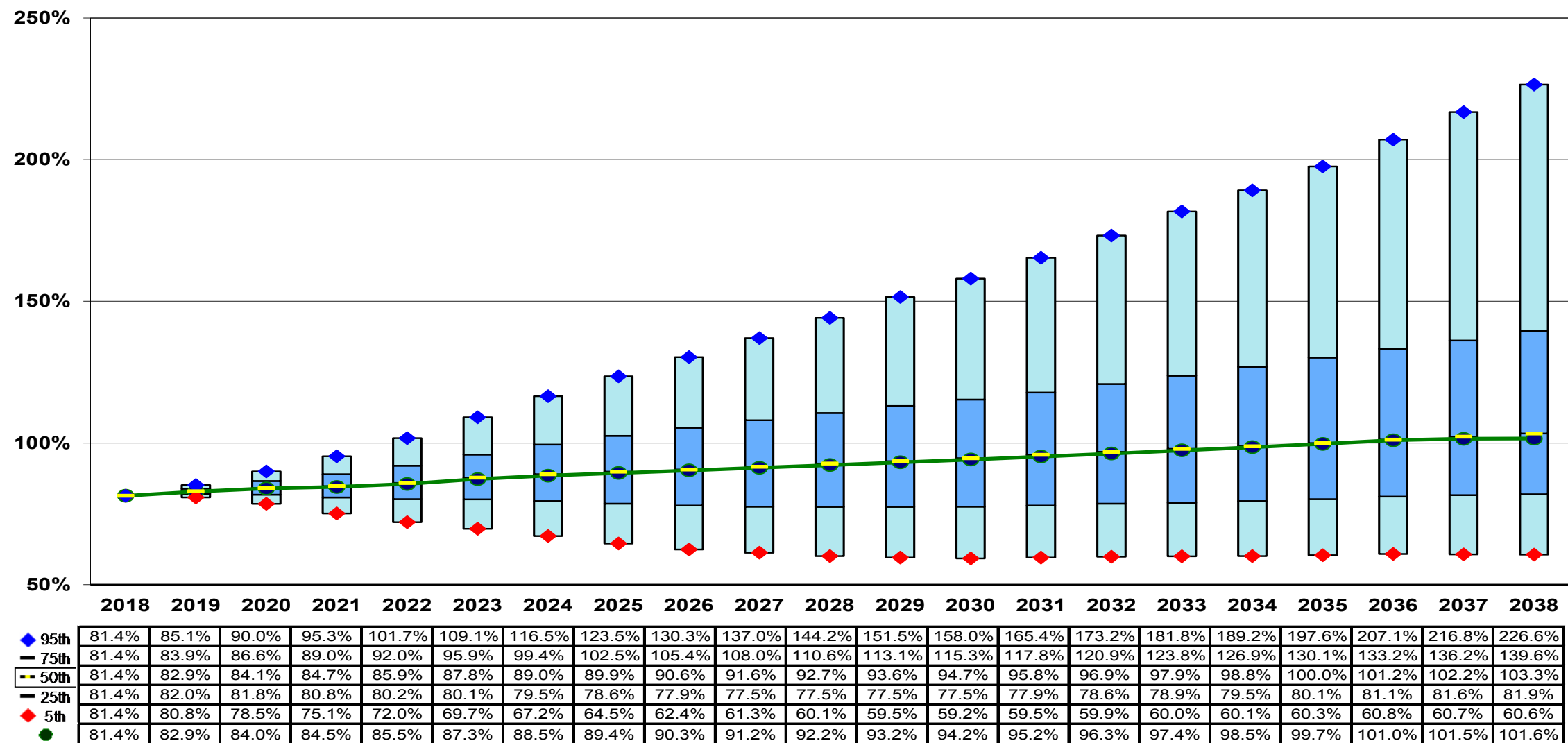
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Scenario 5: 6.5% Investment Return, 2.75% Inflation	37.9%	37.1%	37.3%	37.1%	36.0%	35.7%	35.5%	35.2%	35.0%	34.9%	34.7%	34.5%	34.4%	34.3%	33.7%	27.1%	26.8%	26.4%	21.4%	21.2%	20.6%	20.5%	9.1%

# Stochastic Modeling

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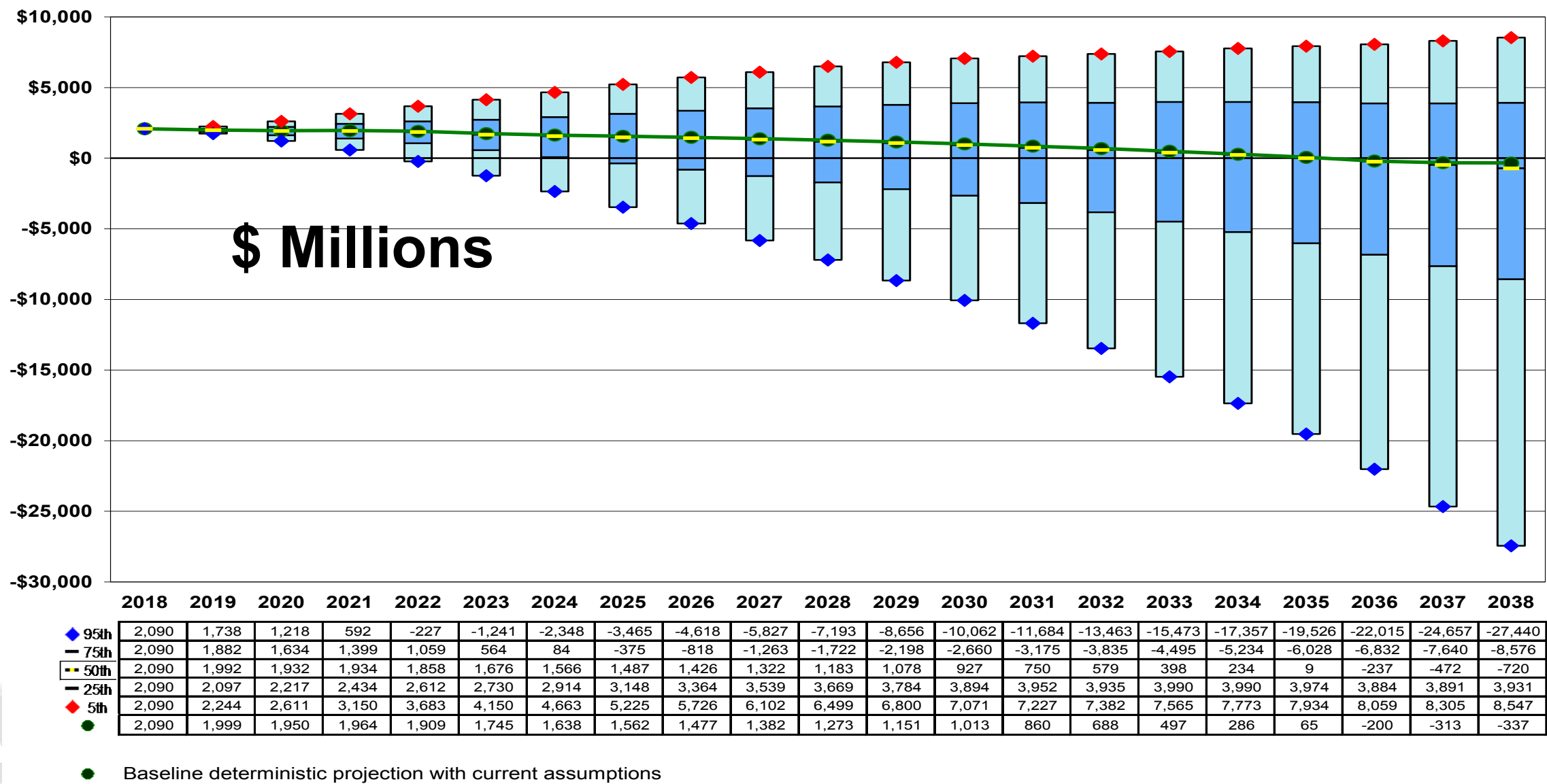
- Probability distribution of future outcomes based on specific matrix of capital market assumptions
- Gives a sense of the chances of both relatively normal and extreme outcomes
- Caution: How fat are your tails?
- Caution: What is an acceptable probability of ruin?

# Projected Funded Ratios (Sample 1937 Act Retirement System)



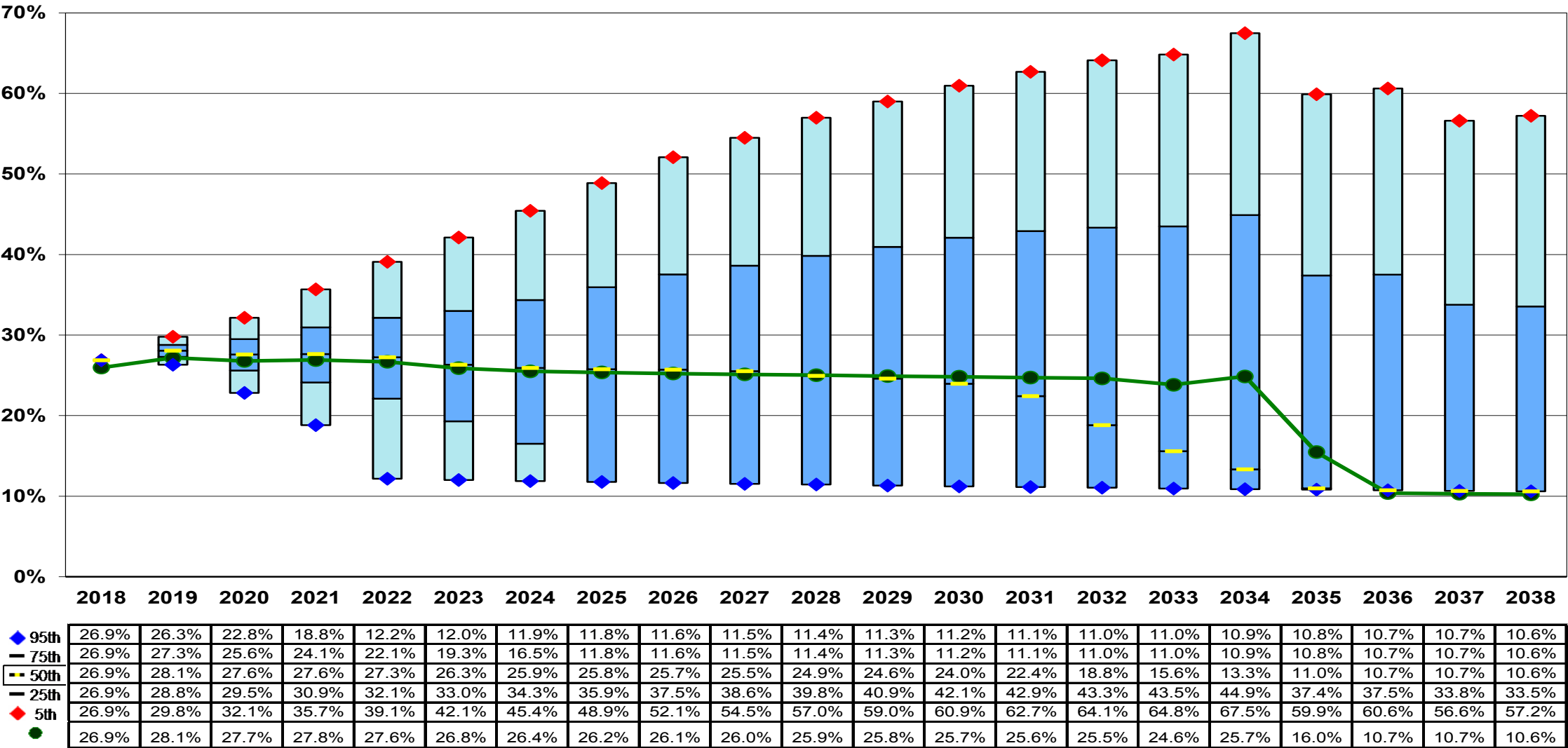
Baseline deterministic projection with current assumptions

# Projected UAAL (Sample 1937 Act Retirement System)





# Projected Employer Contribution Rates (Sample 1937 Act Retirement System)



● Baseline deterministic projection with current assumptions

# Stochastic Modeling

- Lots of numbers, so provide summaries of results
- For example, at any time in the next 20 years:

	Total Employer Rate Increases by at least		
	5% of Payroll (To 32% of Payroll)	10% of Payroll (To 37% of Payroll)	15% of Payroll (To 42% of Payroll)
Probability	30%	22%	16%
	Total Employer Rate Spikes in a Single Year by		
	3% of Payroll	5% of Payroll	7% of Payroll
Probability	10%	3%	2%

# Risk Assessments – New

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## ➤ Stand-alone risk report

- New Risk Assessment Report to include
  - Two new historical information displays
  - Can include various quantitative risk assessments
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  - Actual content based on discussion with MCERA
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# **DISCUSSION**